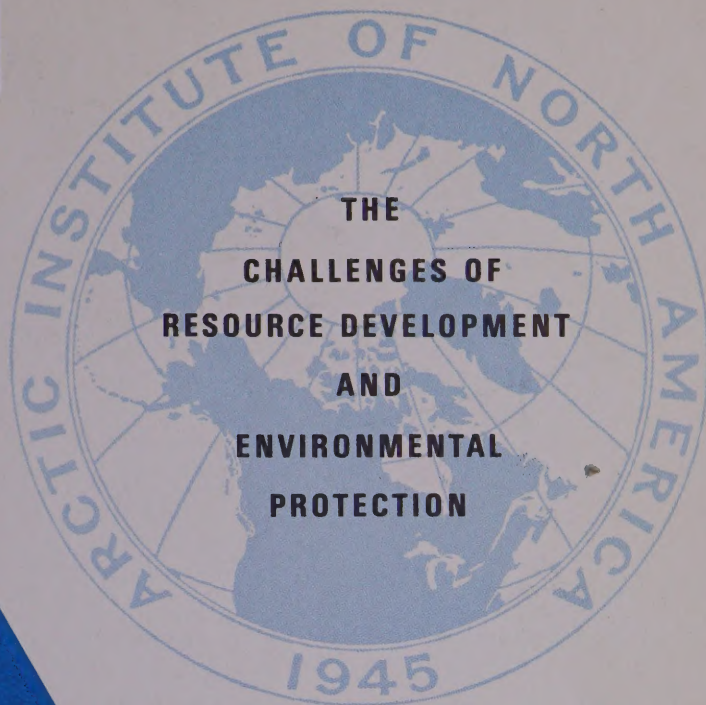


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THE CHALLENGES OF RESOURCE DEVELOPMENT
AND ENVIRONMENTAL PROTECTION
IN THE ARCTIC

A Speech by

The Honorable Hollis M. Dole

Assistant Secretary, Mineral Resources

Department of the Interior

given at the

Eleventh Annual Meeting of

The Arctic Institute of North America

Washington, D. C.

April 13, 1971

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* The opposing forces of resource development and of environmental protection are currently very important in northern Alaska, the only part of the Arctic belonging to the United States. This is of great interest in a much broader perspective also, for it relates to what I believe are mankind's most serious and critical challenges. Let me try to define these challenges and to describe the levels at which significant responses to them can and must be made.

But first, a definition of the environment in which these challenges and response levels exist. We live in a total environment that consists of our living systems, economic systems, and governmental systems superposed on our natural environment. Up to now, the influence of man and his accompanying systems on the natural Arctic environment has been insignificant. As yet man has not greatly influenced the natural phenomena and processes existing there, nor has his understanding of them been very deep. The breadth of our ignorance is revealed in the wide variety of scientific studies now being directed toward the acquisition of baseline data and the development of hypotheses and theories concerning this relatively untouched part of our earth.

* This timely speech reflecting Department of the Interior responsibilities in Alaska, as well as plans for the future, was presented at the second of two sessions of the Eleventh Annual Meeting held in Root Hall, Carnegie Institution of Washington. This year the Annual Meeting, for members and friends of the Arctic Institute, was expanded in recognition of the broad concern of the Arctic Institute and the public at large for the issues and conflicts illuminated by oil developments on the North Slope of Alaska. The program was planned to examine diverse aspects of these issues. At the first session on March 9 Institute staff members gave speeches on the theme of arctic development and environment as follows: John C. Reed - "The North American Resource Potential and Significance - Alaska Points the Way"; Max E. Britton - "The Challenge of Environmental Protection - Opportunity or Last Chance"; and Eric Gourdeau - "Impact of Development on Man - The Gains and Losses."

THE CHALLENGES

Now, what are these critical challenges? The first of them is to provide mineral and energy resources to all mankind in amounts that are adequate for their present and developing needs; the second, to provide these resources without degrading the natural environment that sustains and gratifies humans in innumerable ways, and the third is to acquire, organize, communicate, and apply the knowledge on which the solutions to the first two challenges depend.

The challenge to provide non-renewable mineral resources, including energy-producing materials, for the world's demands can be illustrated by reference to the United States. The U. S. is far from typical for the world because our per capita consumption of mineral raw materials is far greater than that of other nations. The general trend in all nations, however, is in the direction of increased population and increased consumption.

Energy consumption projections based on Gross National Product (GNP) indicate that by 1985 the United States is going to require - at the very least - almost double the amount of energy it used last year to heat its homes, power its factories, mines and transportation systems, and in general to accomplish the work that supports our high level of living. Similar projections indicate a three-fold increase in energy consumption between now and the year 2000.

When we consider the projected demands on the other non-renewable mineral resources, we find a similar situation. Present estimates suggest that the United States' demand for primary minerals will increase four-fold by the year 2000. Specifically, demands for aluminum and titanium are expected to increase six-fold; tungsten and vanadium four-fold; copper, sand and gravel, crushed stone, beryllium, fluorine, tantalum, and magnesium, three-fold. Many others will experience two-fold increases. This projected staggering demand for hard mineral resources imposes a gigantic task of new discovery and new development, not only in the U. S. but throughout the world.

In speaking of projections, some may ask, why allow ourselves to be swept on to such higher and higher levels of consumption? Why not simply curtail our use of resources, perhaps even return to a lower level of living - one that might make us healthier and happier anyway? I won't take the time to speculate about how much popular support we might find for such an idea or whether or not we may be forced to take such a course eventually by reason of resource inadequacy. Instead, I will say without elaboration that, on the one hand, national and world

civilization would collapse and millions upon millions of people would starve if we were to attempt such a retrenchment over a short time span and that, on the other hand, a tapering off in our rate of increase in consumption would only solve our problem temporarily. Whether we set as our goal continued growth in level of living or mere survival, for the next few decades we are going to have to find the raw materials to keep our industrial society going!

Accepting these increasing needs for minerals and fuels, how are we going to meet them? At the present time U.S. domestic onshore oil exploration is at a low, all productive capacity is being utilized, and the United States is inevitably becoming more dependent on the rest of the world for crude oil and residual fuel oil supplies. At the same time, oil is being forced to supply more and more of the energy demanded by the U.S. The role of coal in the energy mix is likely to be curtailed by air quality restrictions for at least the next five years. Hydroelectric power will continue to grow but will be of decreasing relative importance. Nuclear power capacity, though growing, is lagging behind earlier timetables and above cost estimates. In addition to unforeseen technical problems, the nuclear industry has also encountered public concern and resistance to thermal pollution and potential radiation hazards. Unconventional energy sources such as oil from shale and gas from coal are not expected to be available commercially and in quantity before the 1980's, although they, together with nuclear breeder reactors are now the only apparent real possibilities for very long-term energy sources. The situation for hard minerals also calls for new sources, and the need for them and for petroleum both underscore the importance of arctic exploration and development.

Although petroleum exploration has been going on in the Arctic for years, it has been recently accelerated and the next few years will probably see significant increases in the efforts to find and develop new fossil fuel reserves. The search for non-fuel minerals will also intensify as technology provides improved transportation and processing methods. We are actually just now starting the exploration phase that is going to result in the finding of the major non-renewable resource accumulations that are present in the Arctic.

The challenge to protect and enhance our natural environment in the face of all the intentional and unintentional influences of man is inextricably linked to the resource challenge I just described. The quest for and utilization of non-renewable resource raw materials necessarily results in modification of the natural environment. The path of resource use - with its extraction, beneficiation, refining, transportation, fabrication, consumption and disposal elements - is inevitably marked by blazes - and sometimes ugly scars or worse effects - on our natural environment.

If we accept, as we must, the need for a continuing supply of mineral raw materials, then we must accept the fact that the natural environment is going to be influenced by the processes of resource extraction and use. Our problem then, is to minimize the potentially adverse effects of resource development and to remedy them when they occur in spite of our efforts to avoid them. To ignore this problem is to run the risk of immersing ourselves in aesthetically displeasing surroundings; of losing those as-yet-untouched parts of the earth's surface, with their real but hard to quantify values; and of fouling our environment to such an extent that it literally becomes toxic to organic life. As we move to minimize the adverse influence of man's living systems, to attempt to enhance the total environment where and whenever possible, and preserve some untouched areas for aesthetic, recreational and scientific purposes, we must keep in mind that these efforts may add to the costs of the non-renewable resources that are involved and we must be prepared to accept the added costs, knowing that they represent the purchase of values that we are sharing with all mankind and passing on to the world citizens of the future. But, if we put our minds to the task imaginatively, perhaps we can find ways to achieve and effectively meet these challenges with minimum expense by converting liabilities and costs into assets and profits.

Because the Arctic is practically unmodified by the various parts of modern man's living systems that will eventually influence it, it provides a unique test of our abilities to meet these challenges. In the Arctic man and his machines are about to encounter the proverbial blank slate; the problems of minimizing the adverse impact of man's activities are raising the costs of these activities, but certainly such costs are not as high as those involved in the tremendous task of reversing the degradational processes already in effect in our air, our lakes, our rivers, and our communities in the lower latitudes. Meeting this challenge to safeguard the arctic natural environment includes an added dimension because it necessarily involves several sovereign nations, each of whom approaches the Arctic with a different background, different national needs, and different attitudes about resource development.

The third challenge that I'm concerned with is the driving need to acquire the resource and environmental data necessary to meet the other challenges; to organize that data and generalize it rigorously; and to effectively communicate the findings, to all groups of people who have an interest in the Arctic. We all recognize that future actions that are firmly based on sound knowledge are going to meet our challenges much more efficiently and economically than would actions based on assumptions and ignorance.

In the Arctic, the task of acquiring field data and baseline information is made difficult by the natural environment. Yet if we are to meet the resource development and environmental protection challenges effectively, we must know the systems involved. When the time comes to consider the environmental impact of, say, another transportation system like the proposed Alaska pipeline, we must know well in advance the distribution of fish and wildlife and their migration patterns, the distribution of permafrost and the engineering properties of soil and rock materials, and the nature of other aspects of the ecosystem. This will take accelerated research into these questions, just as the quest for resources of minerals and fuels in the Arctic is going to require accelerated research and support at all levels.

THE RESPONSE LEVELS

The challenges I've posed must be met at three different levels of application and involvement. I urge you to examine the role that you as an individual can and should play at each level. The first challenge-response level is international, the second is national, and the third, well, it is hard to label but I will call it individual. It is clear that problems that are international in character require solutions that are also international, whether the problems relate to resource exploitation, protection of the natural environment, or the development of a body of knowledge. The decisions and actions of the United States, and of any other nation, in regard to resources, affect every other nation directly or indirectly and affect not only those who now reside on earth, but all the future generations. In a very real way, all of us, regardless of nationality, are the stewards of the earth and our responsibilities at the international level are emerging, even if they are not yet fully articulated.

The international non-renewable resource development picture has been, and is, a combination of the demands of differing economic and governmental systems. In the most general way, the economic systems have functioned more or less efficiently to bring the least expensive sources of raw materials into production first. This process has been affected to greater or lesser degree at various times and in various places by the demands of national security and sovereignty. No nation on earth is self-sufficient regarding mineral raw materials and the continuation and improvement of world-wide standards of living depend upon the ability of nations to exist with one another, to bargain, and to trade. Peace throughout the whole world would make the development and continuation of mutually beneficial trading systems easier, as well as ending the needless expenditure of non-renewable and human resources that results from conflict. But we are approaching the time when peace will not be possible unless regional and global environmental deterioration and damage can be avoided.

What are the effective international approaches to the resource, environmental and research challenges? It seems to me they can be grouped into two main categories. One is cooperative research and investigation and the other is international agreement based on sound understanding of the resource and environmental problems and their solutions. Neither approach has been pursued nearly as assiduously or as far as it should, but we have some examples to point the way.

There have been joint expeditions to the Arctic such as the 1957-60 and 1967-68 EGIG (Expedition Glaciologique Internationale au Groenland), and the Swedish-Finnish-Swiss Expedition to Nordaustlandet in 1957-58. International commissions, such as that on periglacial geomorphology of the International Geographical Union, offer another way of coordinating arctic research on an international basis. Perhaps the greatest accomplishments will come from internationally coordinated, and in part, cooperative studies of the International Biological Program, the International Geophysical Year, the International Polar Years, the International Hydrological Decade, and the International Decade of Oceanographic Exploration. No international institutes, except for your own Arctic Institute of North America, which is a joint Canadian-United States, and to lesser extent Danish, organization, and which has made some progress in cooperative research effort for more than 25 years, are actively studying the Arctic. This scarcity of cooperation is somewhat mitigated by the fact that many of the national institutes include scientists of different nationalities on their staffs, which at least provides an informal international approach to the acquisition and dissemination of scientific knowledge. The personal contact of one scientist with another now sustains the international response to the challenge of obtaining the knowledge necessary for rational and balanced activity in the Arctic.

International agreements and studies concerned with the natural environment have been relatively few, although those relating to fisheries resources, whale harvesting, and polar bears certainly have as a primary aim the conservation of these natural resources. The Nuclear Test Ban Treaty, with its prohibition of atmospheric testing, stands as an example of how international agreement can prevent further degradation of our natural environment. The Antarctic Treaty illustrates how the influences of scientists on their governments can be combined with the cooperation of those separate governments to formulate a truly international approach to the problems of a region. As you may recall, the final successful proposal of that treaty grew out of the scientific cooperation and communication that took place in Antarctica during IGY. The apparent absence of exploitable non-renewable mineral resources perhaps made this relatively easy to accomplish, but even so, it stands as one example of the renunciation of national territorial claims in favor of joint cooperation, international study, and dedication of a region to

scientific purposes. An even more far-reaching international accord may now be in sight with the United Nations' efforts regarding the seabed and ocean floor beyond national jurisdiction, and calling for a Conference on the Law of the Sea in 1973. These efforts have profound implications for the Arctic, where the broad outer shelf areas may contain accumulations of oil and gas.

Barring the extremely unlikely possibility of early agreement on a comprehensive treaty dealing with the Arctic, international arctic policy for the near future will be the sum of all the national policies of the adjacent and otherwise concerned sovereign powers. International cooperation and understanding in the "emerging Arctic" can be advanced if each concerned power develops and clearly states its policy in regard to the development of non-renewable mineral resources, indigenous human populations, protection of the natural environment, and scientific inquiry and exchange of information. But for the time being, the main policy initiative must come from national and state governments. This brings me to the second challenge-response level, and more particularly to my own area of responsibility.

In candor, I must say that the United States does not at this time have a formally articulated arctic policy, but we do have a well-developed national response mechanism that has been, is and will be meeting the challenges of the Arctic. Many parts of this response mechanism are in the U.S. Department of the Interior and Interior's leadership role in arctic activities is becoming increasingly apparent. Let me describe some of our activities as an example of national level response to the resource, environmental, and research challenges.

The Department of the Interior activities in the Arctic, specifically in Alaska, are broadly resource oriented. Thus, the work of the Geological Survey is designed to establish the geologic framework of the State and to provide data needed to inventory mineral resources. In addition to these studies, the Survey is also deeply concerned with engineering geology problems in the State. The Bureau of Mines gathers data on mineral production and is charged with the promotion of safe and healthful working conditions in the mineral industry and the investigation of mining systems that are best suited to Alaska's natural environment. The EROS program is a relatively new one that utilizes or will utilize remote sensors of all types from aircrafts and satellites to generate information that, together with ground-gathered geologic data, will aid in the evaluation of mineral resources and the geologic environment.

Three Interior bureaus are human resource-oriented as well as natural environment-oriented. The Bureau of Indian Affairs has the

responsibility for Federal Government liaison with the Eskimos, Aleuts, and Indians, who are in transition from their original subsistence cultures into modern industrialized society. The Bureau of Outdoor Recreation is concerned with the utilization of the natural environment by man with due regard for enhancement of man's outdoors experience and for protection of the environment necessary for that experience. The National Park Service oversees and protects one of our greatest national parks at Mount McKinley, as well as Katmai, Glacier Bay, and Sitka National Monuments. Their responsibilities have both natural environmental and human experience dimensions.

The Bureau of Sports Fisheries and Wildlife shares with State of Alaska counterpart bureaus the study, protection, and enforcement functions associated with the naturally occurring biome. The Bureau also administers wildlife refuges that include some of the major waterfowl nesting areas of North America as well as the Arctic National Wildlife Refuge.

And finally, as landlord for much of the public domain in Alaska, the Interior Department through the Bureau of Land Management, is responsible for the classification and management of large tracts of land in the interior of the State, and together with the Geological Survey, for administering Federal mineral leasing laws and regulations in the State, both on land and offshore.

The deep involvement of the Interior bureaus and offices in the problems of arctic non-renewable resource development and protection of the natural environment demonstrates the leadership role that the Department has in arctic affairs. As the main steward for the public lands, as the protector of fish and wildlife resources, and as the scientist synthesizing the geologic and ecologic framework of Alaska we bring together and integrate almost all of the elements required in the total resource inventory that is necessary before judgements about resource utilization can be made.

I hasten to mention the other Federal agencies that play important roles in the arctic part of the United States and to point out our successful collaborations with them. The Office of Naval Research with its magnificent Barrow Naval Arctic Research Laboratory, the Office of Naval Petroleum and Oil Shale Reserves, and the Corps of Engineers Cold Regions Research and Engineering Laboratory have a long history of mutually successful cooperation with the Geological Survey in particular. The U.S. Coast Guard is a valued collaborator with the Survey in oceanographic studies, as is the Coast and Geodetic Survey. The Bureau of Commercial Fisheries was recently transferred from Interior and retains close collaborative ties. The Water Quality Office and the

National Air Pollution Control Administration, both of EPA, have had or are now developing close relations with the Geological Survey and the Bureau of Land Management as a result of their mutual concern with protection of the natural environment. Lastly, the Forest Service is the steward for forest and recreational lands in subarctic Alaska and collaborates with the BLM.

The mechanisms thus exist at the national and state level in the United States to meet the challenges of resource development, environmental protection, and knowledge acquisition. Similar agencies and mechanisms exist in the other countries concerned with the Arctic. Here and elsewhere, we could do with more inter-bureau coordination, but what is most important for us now is to formulate and formalize an arctic policy that will clearly spell out how the U.S. intends to approach the problems of arctic development and protection. The Department of the Interior, in its leadership role in the Arctic, intends to work toward that end and to encourage in every way the articulation of arctic policy by all concerned nations.

Earlier in this talk I put the label "individual" on the third challenge-response level. I'd like to expand on that with a brief analysis of the roles that each of you have played and will play in meeting the three challenges. Every one of you - geologist, ecologist, member of a conservation group, industry representative, or concerned citizen - has a part to play in what has become an issue of major importance and concern.

Geologists and geophysicists have developed to a high degree the techniques of finding petroleum and other resources, and have discovered the resources now known in the earth. The role of the engineering geologist and environmental engineer is becoming increasingly important also in the protection of natural environments. Their recommendations maximize the security and integrity of structures, and they minimize adverse impact on the environment.

The ecologist studies and appraises environments. From appropriate baseline studies he is able to help predict effects on the environment of contemplated developments. It is not possible to tamper with any substantial component of an environment without affecting all the other components. The ecologist must advise on the nature and significance of those effects.

A member of a conservation organization belongs to the organization because he believes in the objective of protecting the environment, or some segment thereof, that is important to him and his organization. He must determine his position and his participation in terms of his

commitment and belief. So too, industry representatives are concerned with seeing that the public is provided with the resources, goods, or services, that are required. And finally, the concerned citizen must appraise and balance all the inputs to which he is exposed in terms of what he wants to do about the whole situation, and must involve himself in the election of the representatives who will legislate the policies and practices that determine what will or will not be done. In truth, the individual challenge is real and very important.

It takes an individual commitment from each of us, but we must make it if we are going to be part of the solutions to the critical challenges. We each have a responsibility, as individuals and as essential parts of organizations, to further man's goals at the national and international levels.

REMINDERS

Let me conclude by reminding you again of what we are faced with. First of all we have the Arctic - practically untouched by the governmental, economic, and living systems of modern man - one of the last places on the earth where we shall have the opportunity to start from scratch in the exploitation of mineral resources while at the same time protecting the natural environment with the knowledge gained from our successes and failures elsewhere. Here is the place where we can apply our knowledge and carefully develop methods of exploration, extraction, and transportation that are compatible with the environment and do not degrade it unnecessarily.

We also have the growing needs of the world's peoples for non-renewable resources. We are learning that we cannot burden our natural environment indefinitely with our waste and the other scars of our living systems without injuring man's health, mind, or spirit. We are learning that resource development and use and our environment are inextricably linked together by economics and by the way we live and support ourselves. And, we are learning that there are real costs involved in both, and that a lessened cost of resource extraction may mean an increased cost of environmental protection or restoration.

We also see that wise stewardship of the earth, whether it is at an international, national, local, or individual level requires systematic research, communication, and application of knowledge. The Department of the Interior intends to continue its leadership in U. S. arctic affairs and to encourage planning for a comprehensive arctic policy that would state the political, scientific, economic, defense, and other interests of the U. S. in the North and that would establish our dedication to mutually beneficial cooperation with our arctic neighbors and other na-

tions in exploration, exploitation, and scientific studies, and to the free exchange of technical, scientific, and economic data regarding the Arctic.

Last of all, let me remind each of you of the personal responsibility you have to help lay the groundwork for the far-reaching decisions that are going to be made about the Arctic. Your dedication to scientific research, to the dissemination of your findings, and to their application is essential for wise national and international responses to the three challenges that I have discussed tonight.

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